**Mark W. Powell**

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**WORK EXPERIENCE**

Member of the Technical Staff, Jet Propulsion Laboratory, Telerobotics Research and Applications Group, January 2001 to present.

- Designed and implemented advanced data visualization for conventional and hyperspectral imagery for the Mars Exploration Rover mission science team, specifically image cubes, data fusion, panoramic mosaics, and 3D graphical terrain and rover simulation for the Science Activity Planning (SAP) MER operations interface.
- Developing MER public outreach version of the SAP science planning interface with focus on low resource utilization (modest RAM, disk, and CPU requirements) and engaging graphical interface features including panoramic image viewer and 3D rover simulation.
- Leading the 2002 MER-FIDO rover field trial ground operations effort: telemetry processing, activity sequence planning, and facility layout.
- Conducted rover science training and ground operations for international student groups during the 2001 LAPIS rover field trial and the 2002 Planetary Society Red Rover Goes to Mars events.
- Conducted downlink telemetry processing and facility layout for the 2001 MER-FIDO rover field trial.

August 1996-December 2000. **Research Assistant**, University of South Florida, Tampa
Investigating the use of color, texture, and range from images to objectively evaluate burn scar appearance.

August 1996-December 2000. **Lecturer**, Java Programming, Color, and Range Image Processing, University of South Florida, Tampa
Holding seminars and guest lecturing on the use of Java as a general purpose programming language, its impact on software engineering, and applications in image processing. Conducting lectures on color and range image processing in Image Processing and Computer Vision courses.

May 1999 - July 1999. **Instructor**, Object-Oriented Application Development in Java, University of South Florida, Tampa
Taught undergraduate level course in object-oriented programming, the Java language, and object-oriented design using CRC cards, collaboration diagrams, class diagrams, and UML. Term project was a tool to buy a custom PC over the web and involved fundamental event-driven GUI techniques, distributed processing, thread programming and relational database design.

January 1994 - January 1996. **Software Engineer**, Salomon Brothers, Inc., Tampa
Developed program modules in C++ for an international financial database for financial reporting, billing and legal documentation assistance.

August 1993 - December 1994. **Software Engineer**, Johnson and Johnson, Tampa
Developed CAD solutions for surgical tray manufacturing, layout, and design.

## EDUCATION

**Ph.D. - Computer Science**, December 2000, University of South Florida, Tampa

Dissertation: Toward Objective Color from Images (received the 2001 USF Outstanding Dissertation Award)

Designed a system that explicitly models illumination and reflectance, facilitating the reduction of illumination variance from changes in illumination, surface and camera viewing geometry. Applications include: (1) objective color measurement of burn scars to aid surgeons in evaluating healing techniques and (2) photo-realistic rendering of objects from 3D range images by removing illumination intensity variation after image capture.

**Master of Science - Computer Science**, August 1997, Summa Cum Laude, University of South Florida, Tampa

Thesis: Comparing Curved Surface Range Image Segmenters

Designed a framework for performance evaluation of curved-surface range image segmentation algorithms. Constructed a curved surface range image dataset and ground truth segmentations using a structured light scanner. Designed an empirical, objective performance evaluation methodology for range image segmentation algorithms.

**Bachelor of Science - Computer Science**, May 1992, University of South Florida, Tampa

## PUBLICATIONS

Powell, M.W., Norris, J.S. and Backes, P.G.
**Visualization of Spectroscopy for Remote Surface Operations**, presented at the 2002 IEEE Aerospace Conference.

Norris, J.S., Wales R., Powell, M.W., Backes, P.G. and Steinke R.C.
**Mars Mission Science Operations Facilities Design**, presented at the 2002 IEEE Aerospace Conference.

Backes, P.G., Norris, J.S., Powell, M.W., and Steinke R.C.
**Relating Downlink Products to Uplink Commands in Mars Rover Operations**, presented at the 2002 IEEE Aerospace Conference.

Powell, M.W. and Goldgof, D.B.
**Software Toolkit for Teaching Image Processing**, in ***International Journal of Pattern Recognition and Artificial Intelligence***, December 2001.

Powell, M.W., Sarkar, S. and Goldgof, D.B.
**A Simple Strategy for Calibrating the Geometry of Light Sources**, to appear in *IEEE Transactions on Pattern Analysis and Machine Intelligence.*

Min, J., Powell, M.W., and Bowyer, K.W.
**Progress in Automated Evaluation of Curved Surface Range Image Segmentation**, International Conference on Pattern Recognition, Barcelona, Spain, September 2000.

**PUBLICATIONS (continued)**

Powell, M.W.
**Vision Software for Teaching and Research**, presented at the Workshop on Undergraduate Education for Image Computation at the Conference on Computer Vision and Pattern Recognition, Hilton Head, South Carolina, June 2000.

Powell, M.W., Sarkar, S. and Goldgof, D.B.
**Calibration of Light Sources**, presented at the *IEEE Conference on Computer Vision and Pattern Recognition*, Hilton Head, South Carolina, June 2000.

Hyams, J., Powell, M.W. and Murphy R.
**Cooperative Navigation of Micro-Rovers using Color Segmentation**, in *Autonomous Robots*, July 2000.

Hyams, J., Powell, M.W. and Murphy, R.
**Position Estimation and Cooperative Navigation of Micro-Rovers using Color Segmentation**, *IEEE International Symposium on Computational Intelligence in Robotics and Automation*, Monterey, California, November 1999.

Powell, M.W., Sarkar, S. and Goldgof, D.
**Color Correction using Explicit Illumination Models, Color and Registered Range**, *IEEE Workshop on Photometric Modeling for Computer Vision and Graphics*, Fort Collins, Colorado, June 1999.

Powell, M.W. and Murphy, R.
**Position Estimation of Micro-Rovers using a Spherical Coordinate Transform Color Segmenter**, *IEEE Workshop on Perception for Mobile Agents*, Fort Collins, Colorado, June 1999.

Sarkar, S., Goldgof, D.B., Powers, P., Tsap, L. and Powell, M.W.
**Objective Evaluation of Burn Scars using Computer Vision Techniques**, *Proceedings of the Annual Meeting of the American Burn Association*, pp. S165, March 1999. (Published as an issue of the *Journal of Burn Care and Rehabilitation*, 20(1), part 2, Jan/Feb 1999.)

Powell, M.W., Sarkar, S., Goldgof, D.B., Powers, P., and Cruse, W.C.
**Progress in Color-Texture Assessment of Burn Scars**, *11th Annual Regional Burn Seminar, Southern Medical Association*, Dec 1998.

Powell, M.W., Bowyer, K.W., Jiang, X. and Bunke, H.
**Comparing Curved Surface Range Image Segmenters**, *International Conference on Computer Vision*, Mumbai, India, January, 1998.

**ADDITIONAL SKILLS**

Java, C++, C, Motif, Unix, Pascal, Fortran, Matlab

**AWARDS**

2001 University of South Florida Outstanding Dissertation Award, University of South Florida Honors Program, Florida Academic Scholar

**AFFILIATIONS**

IEEE Computer Society, Reviewer for *Pattern Recognition, Image and Vision Computing, IEEE Pattern Analysis and Machine Intelligence*

**REFERENCES**

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